

Metal Matrix Composite Enhanced Aluminum Structures, Phase II

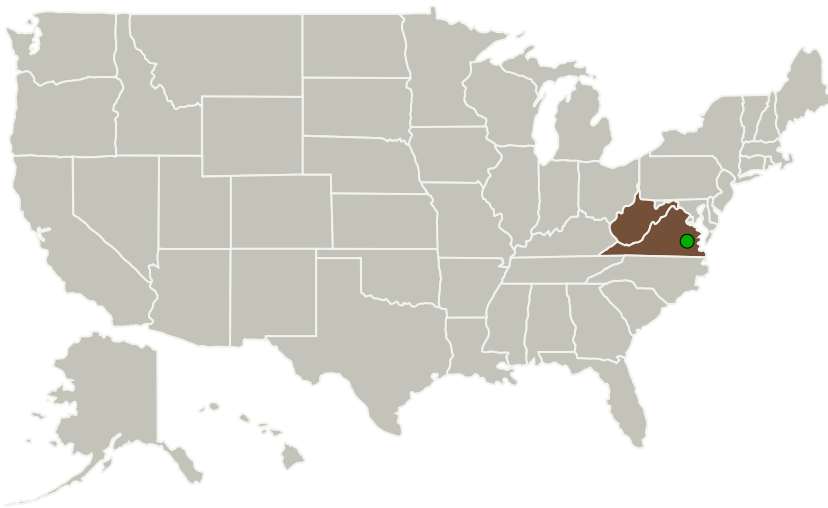
Completed Technology Project (2017 - 2021)



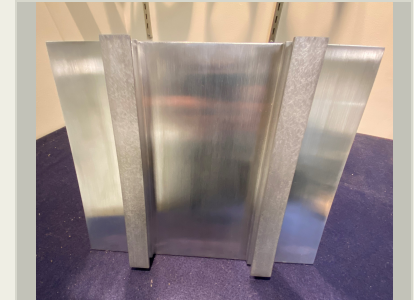
Project Introduction

The proposed research pursues a path for reducing structural weight, increasing structural performance, and reducing fabrication cost while also minimizing maintainability. The approach, which is based on selective reinforcement, is a change in the basic design philosophy and will result in the development of a hybrid material form. The selective reinforcement approach allows the structural design requirements to define the material form. This method is the reverse of the typical development flow path used for building structures. This backward path results in more efficient material forms that are of greater value to structural engineers. Specifically, the proposed effort will combine a metal matrix composite (MMC) prepreg tape with an ultrasonic additive manufacturing process. The combination of these technologies will lead to enhanced lightweight, cost-effective metallic structures with shielding and thermal management built in.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Touchstone Research Laboratory, Ltd.	Lead Organization	Industry	Triadelphia, West Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations

Virginia

West Virginia

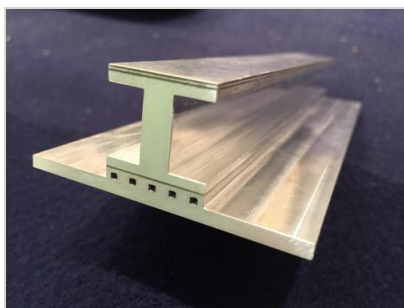
Project Transitions

**April 2017:** Project Start**May 2021:** Closed out

Closeout Documentation:

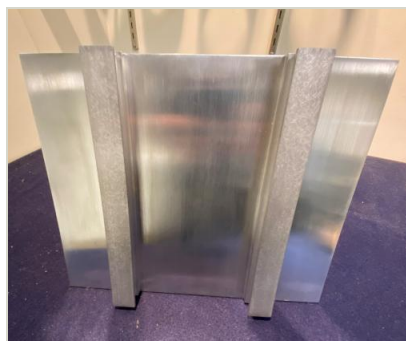
- Final Summary Chart(<https://techport.nasa.gov/file/141085>)

Images



Briefing Chart Image

Metal Matrix Composite Enhanced Aluminum Structures, Phase II
Briefing Chart Image
(<https://techport.nasa.gov/image/131293>)



Final Summary Chart Image

Metal Matrix Composite Enhanced Aluminum Structures, Phase II
(<https://techport.nasa.gov/image/133121>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Touchstone Research Laboratory, Ltd.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

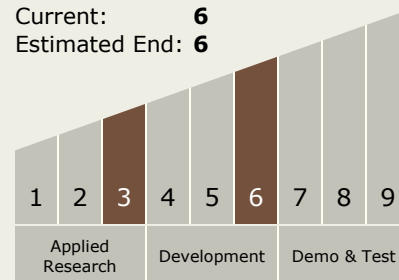
Brian L Gordon

Technology Maturity (TRL)

Start: 3

Current: 6

Estimated End: 6



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System